Lakes, Ponds and Reservoirs

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Rathbun Lake Zebra Mussel Assessment

During 2009 zebra mussel (*Dreissena polymorpha*) veligers were first detected in Lake Rathbun. Although research has been conducted on the effect of zebra mussels on Great Lakes food webs, little attention has been given to the possible effects of this invasive species on reservoir systems, due, in part, to the lack of larval fish, plankton, and water quality data prior to zebra mussel establishment in such systems. Fortunately, a 15-year data set of such information exists for Lake Rathbun prior to zebra mussel contamination. The objectives of this study are to determine current density and species composition of icthyoplankton in Rathbun Lake to document potential changes in ichthyoplankton following zebra mussels establishment in the Rathbun Lake.

The primary food source for both zooplankton and the invasive, filter feeding zebra mussel is phytoplankton. With their ability to attain high densities, zebra mussels may exert a bottom-up influence on aquatic food webs, affecting zooplankton and both planktivorous and larval piscivorous fish that are dependent upon zooplankton as a food source. Food deprivation in the larval fish stage may lead to reduced recruitment, stunted growth, and a decrease in overwinter survival. Zooplanktivorous fish such as age-0 gizzard shad (*Dorosoma cepedianum*) often form the basis of piscivorous fish diets, and are key components of white crappie (*Pomoxis annularis*), and walleye (*Sander vitreus*) diets. These are important sport fish species for Rathbun Lake. Additionally, Rathbun Lake is one of two major walleye brood stock lakes for the state of Iowa. Any detrimental effects to walleye recruitment and growth in Rathbun Lake will affect brood fish collections, and, hence, the walleye stocking program for the state. Age-0 gizzard shad abundance during the summer and fall is a key determinant of recruitment and condition of sport fish species in reservoirs. Growth of piscivorous fishes is closely linked to the abundance of their preferred zooplanktivorous prey species. Decline in abundance of zooplanktivorous fish species because of zebra mussel presence may result in negative effects for piscivorous top predators.

Results for 2010 revealed gizzard shad and white bass were first detected in late May; crappie were first detected June 1. Other fish collected included largemouth bass, common carp and species of *lepomis* and *notropis*. This is considered to be a long term study, with fish abundance and size eventually correlated with reservoir hydrology, zooplankton abundance, and zebra mussel establishment.